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Sanitary napkin

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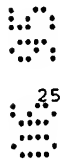
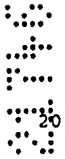
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ABSTRACT

A sanitary napkin (1) including a pair of longitudinally stretchable barrier flaps (8) provided on either side thereof, said napkin (1) being folded in three layers by folding back longitudinally opposite end sections (14, 15) thereof along lines extending transversely thereof as well as transversely extending across said barrier flaps, and said napkin (1) being packed in an envelope (2).

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Invention Title:

SANITARY NAPKIN

Our Ref : 414755
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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

- 1 -

SANITARY NAPKIN

The present invention relates to a sanitary napkin and, more particularly, to a sanitary napkin or menstruation pad and the like individually packaged in an envelope.

Conventional sanitary napkins generally are individually packaged in an envelope for supply to consumers. As disclosed, for example, in Japanese Laid-Open Utility Model Application No. 1993-93430, some napkins have in their laterally opposite sides barrier flaps with elastic members under a tension exerted longitudinally of the napkin so that the flaps may be normally biased to contract. According to the technique disclosed in this reference, the flaps contract and rise on the skin-contacting surface of the napkin so as to form the barriers preventing menstrual discharge from sideways leaking as the napkin is worn and inwardly curved longitudinally of the napkin.

It is possible also for the well-known napkin having the aforesaid barrier flaps as described above to fold this in two or three and then to package this individually for supply to consumers. Needless to say, the napkin is put in contact with the sensitive part of a wearer and therefore the elasticity of the flaps must be moderate to avoid an

apprehension that the flaps might gauge into the skin of the sensitive part. However, the napkin is relatively rigid due to the presence of the liquid-absorbent core with a compressed fluff pulp layer and, if the elasticity of the flaps is excessively low, the rigidity thereof might overwhelm the elasticity to prevent the flaps from sufficiently contracting and rising on the skin-contacting surface of the napkin. In consequence, there occurs an apprehension that the flaps might be incapable of reliably preventing menstrual discharge from sideways leaking.

It is an object of this invention to provide an improved sanitary napkin.

According to the invention there is provided an individually packaged sanitary napkin including a liquid-permeable topsheet, a liquid-impermeable backsheet, a liquid-absorbent core disposed therebetween, a pair of side flaps formed by portions of one of said topsheet and said backsheet extending outward beyond transversely opposite side edges of said core and a pair of longitudinally stretchable barrier flaps provided on said side flaps, and said napkin being folded in three layers by folding back longitudinally opposite end portions thereof along folding line extending transversely of said napkin and then packed individually in an envelope, wherein:

each of said barrier flaps having a proximal edge and a distal edge is formed of an oblong nonwoven fabric of thermoplastic synthetic fibers and secured along said proximal edge on each of said side flaps and includes a longitudinally stretchable intermediate section and a longitudinally non-stretchable opposite end sections extending continuously from longitudinally opposite ends of said intermediate section;

said intermediate section has a length of 37 to 70% with respect to the entire length of said napkin and said folding lines transversely extend across said intermediate section; and

said end sections are non-stretchable by bonding integrally to each of said side flaps.

With the sanitary napkin arranged in this manner, the stretchable section of each flap tends to contract as the napkin is picked out from the envelope and longitudinally unfolded. More specifically, the napkin folded in three layers have a residual stress of folding along the folding lines, under the effect of which, when



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the longitudinally intermediate section of the folded napkins is placed on a horizontal surface, the longitudinally opposite end sections of the napkin is unfolded in a slightly risen state. At the same time, the stretchable section of each flap contracts between its longitudinally opposite ends and rises on the

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skin-contacting surface of the napkin.

Fig. 1 is a perspective view of an individually packaged sanitary napkin;

Fig. 2 is a plan view showing an unfolded sanitary napkin as partially broken away;

Fig. 3 is a sectional view taken along a line X - X in Fig. 2;

Fig. 4 is a perspective view of a sanitary napkin placed on a horizontal surface; and

Fig. 5 is a sectional view taken along a line Y - Y in Fig. 4.

Referring to Fig. 1, a sanitary napkin 1 is formed longitudinally long and folded in three layers and individually packaged in an envelope 2, referring to Fig. 2, the sanitary napkin 1 is picked out from the envelope 2 and horizontally unfolded. The napkin 1 includes a liquid-permeable topsheet 3 made of a nonwoven fabric of thermoplastic synthetic fibers, a liquid-impermeable backsheet 4 made of a thermoplastic synthetic resin film and a liquid-absorbent core 5 made of a mixture of fluff pulp and super absorbent polymer powder and disposed between these two sheets 3, 4. The top- and back sheets 3, 4 are water-tightly bonded together in their portions extending outward beyond a

peripheral edge of the core 5 so as to define longitudinally opposite end flaps 6 having no stretchability and transversely opposite side flaps 8. A skin-contacting surface of the topsheet 3 in each side flap 8 carries thereon a barrier flap 10 having an intermediate section 24 adapted to be elastically risen against a wearer's skin, as will be described later more in detail.

Longitudinally opposite (upper and lower as viewed in Fig. 2) end portions 14, 15 of the napkin 1 are folded inward along imaginary lines 12, 13 longitudinally dividing the napkin 1 into three substantially equal parts so that the end portions 14, 15 may be placed one upon another with the topsheet 3 lying inside, and the napkin 1 thus folded in three layers is individually packaged in the envelope 2 shown by a two-dot-chain line in Fig. 1. A flap 27 of the envelope 2 may be opened in the direction as indicated by an arrow A to pick out the napkin 1 therefrom.

The barrier flap 10 includes an oblong sheet of liquid-impermeable or water-repellent nonwoven fabric made of thermoplastic synthetic fibers and an elastic member 20 adhesively bonded with a tension to the inner side of a side edge 19 defined by folding said sheet. The barrier flap 10 is thus defined by the free side edge 19, a side edge 19A

opposed to the free side edge 19 and bonded to the flap 8 by means of linearly applied hot melt adhesive 17, longitudinally opposite non-stretchable end sections 22, 23 fixed to the flap 8, and a stretchable intermediate sections 24 extending between these longitudinally opposite end sections 22, 23. The flap 8 and the barrier flap 10 associated with this flap 8 are fused together by heat embossing them at the longitudinally opposite end sections 22, 23 of the barrier flap 10 to enhance their rigidity so that the end sections 22, 23 never contract even if these end sections contain therein the elastic member 20.

As will be apparent from Fig. 2, the lines 12, 13 along which the napkin 1 is folded in three layers transversely extend across the barrier flap 10 at its intermediate section 24 preferably at a distance of 10mm or longer from the inner ends 22A, 23A of the longitudinally opposite end sections 22, 23, respectively.

Referring to Fig. 3, with the napkin 1 horizontally unfolded, the intermediate section 24 of the flap 10 is shown in a flat state.

Referring to Fig. 4, the napkin 1 has been picked out from the envelope 2 and placed on a horizontal surface. Even after the napkin 1 has been unfolded, there remain along the

lines 12, 13 residual stress of folding and, when a section extending between the folding lines 12, 13 is horizontally placed, the longitudinally opposite end sections 14, 15 slightly rise on these folding lines 12, 13. In this state of the napkin 1, distance in a straight line between the respective inner ends 22A, 23A of the longitudinally opposite end sections 22, 23 of the flap 10 becomes shorter than in the napkin 1 horizontally unfolded (Fig. 2) and the intermediate section 24 of the flap 10 correspondingly contracts. Consequently, the side edge 19 and portion adjacent this side edge 19 rise on the skin-contacting surface of the napkin 1.

Referring to Fig. 5, the flap 10 rises at its intermediate section as well as the portion adjacent this to form a barrier serving to prevent menstrual discharge from sideways leaking. While the arrangement is shown as the side edge 19 lies outside and the side edge 19A opposed to the side edge 19 lies inside, it is also possible to arrange so that the side edge 19 lies inside. A longitudinal dimension of the intermediate section 24 is preferably 37 to 70% and more preferably 40 to 65% with respect to the entire length of the napkin 1. If less than 37%, the entire length of the intermediate section 24 will be substantially equal to or

less than the distance between the folding lines 12, 13 and it will be very difficult or quite impossible to obtain the expected effect of folding the napkin 1. If 70% or longer, on the other hand, it will be required to bond the elastic member 20 to the flap 10 with a relatively high tension, i.e., a relatively high stretching ratio to achieve sufficient contraction of the intermediate section 24 or this intermediate section 24 will slacken and often fail to rise. However, increased stretching ratio will disadvantageously impair softness and uncomfortably stimulate the sensitive part of a wearer.

By utilizing the residual stress of folding remaining in the napkin 1 along the lines 12, 13 to contract the intermediate section 24 of the barrier flap 10, an effective barrier can be reliably formed. In other words, a contractile force of the flap 10 can be saved sufficiently to soften a contact of the flap 10 with the sensitive part of a wearer and thereby to improve comfortableness to wear.

For the individually packaged sanitary napkin 1 according to the invention, the top- and backsheets 3, 4 as well as the core 5 may be made of materials usually employed in this field of industry to make these members. Bonding or fixation of the respective members may be achieved by using

hot melt adhesive or heat seal technique, and such bonding technique may be used instead of the previously mentioned heat-embossing. It is also possible without departing from the scope of the invention to form the flap 10 by a rubber sheet or stretchable nonwoven fabric and thereby to eliminate use of the elastic member 20 or to limit the extent over which the elastic member 20 should be bonded to the intermediate section 24.

Though not shown, at least the core 5 may be provided on its top surface with compressed grooves each presenting a concave (preferably, V-shaped) cross-section extending along the respective folding lines 12, 13 not only to assist contraction of the barrier flap 10 but also to suppress diffusive permeation of menstrual discharge toward the longitudinally opposite end sections 14, 15. Furthermore, the intermediate section 16 may be also provided at least along its middle line with a similar compressed groove connected to said transverse grooves formed in the top surface of the core 5 to enhance the above-mentioned function.

According to the invention, the sanitary napkin 1 is folded in three layers along the lines transversely extending across the stretchable section of each barrier flap and

individually packaged in the envelope, so the residual stress of folding functions to facilitate contraction of the stretchable section and thereby to reliably form the barrier preventing menstrual discharge from sideways leaking.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An individually packaged sanitary napkin including a liquid-permeable
 5 topsheet, a liquid-impermeable backsheet, a liquid-absorbent core disposed
 therebetween, a pair of side flaps formed by portions of one of said topsheet and
 said backsheet extending outward beyond transversely opposite side edges of
 said core and a pair of longitudinally stretchable barrier flaps provided on said
 side flaps, and said napkin being folded in three layers by folding back
 longitudinally opposite end portions thereof along folding line extending
 10 transversely of said napkin and then packed individually in an envelope, wherein:
 each of said barrier flaps having a proximal edge and a distal edge is
 formed of an oblong nonwoven fabric of thermoplastic synthetic fibers and
 secured along said proximal edge on each of said side flaps and includes a
 longitudinally stretchable intermediate section and a longitudinally non-stretchable
 15 opposite end sections extending continuously from longitudinally opposite ends of
 said intermediate section;
 said intermediate section has a length of 37 to 70% with respect to the
 entire length of said napkin and said folding lines transversely extend across said
 intermediate section; and
 20 said end sections are non-stretchable by bonding integrally to each of said
 side flaps.
2. An individually packed sanitary napkin according to claim 1, wherein said
 folding lines are spaced by 10mm or longer from boundaries between said
 25 intermediate section and said end section, respectively.
3. An individually packaged sanitary napkin according to claim 1 or claim 2,
 wherein at least said core is provided on its top surface with compressed grooves
 extending along each of said folding lines.

4. An individually packaged sanitary napkin according to any one of the preceding claims, wherein each of said barrier flaps is provided along said distal edge thereof with an elastimember under tension.

5. An individually packaged sanitary napkin substantially as herein described with reference to the accompanying drawings.

DATED:

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UNI-CHARM CORPORATION

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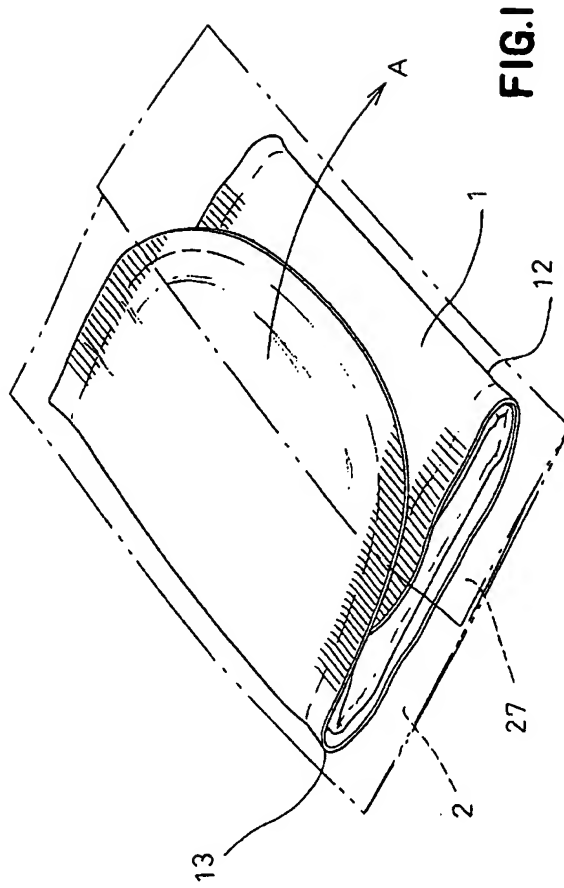
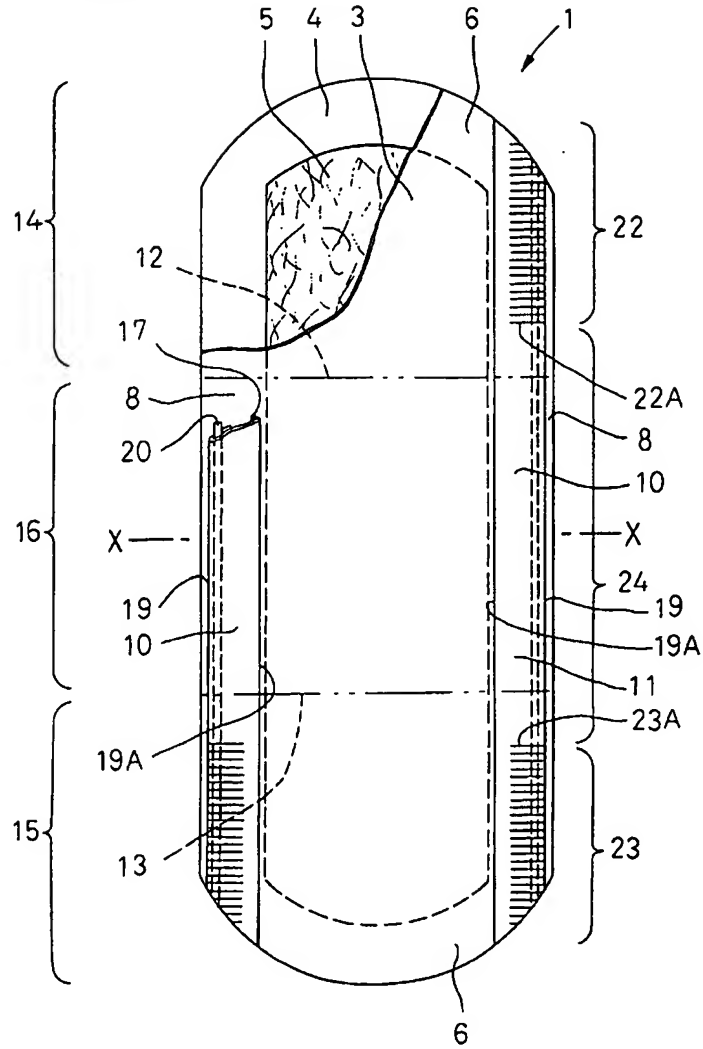
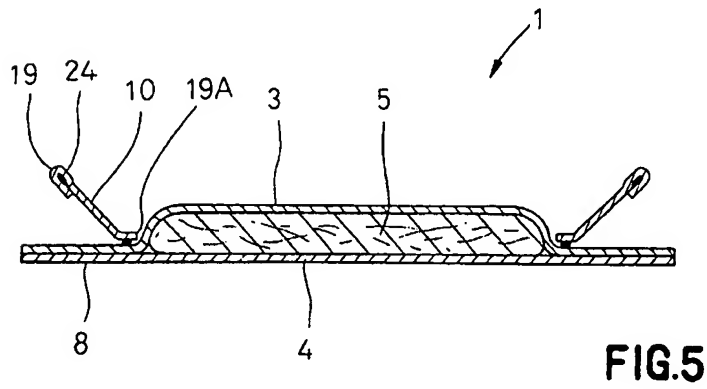
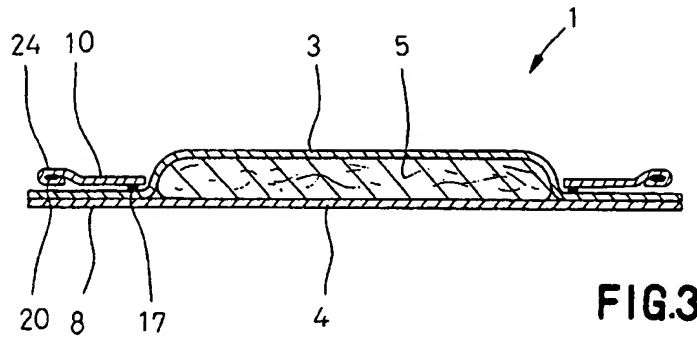


FIG.2





The image shows four 5x5 dot patterns arranged vertically. The first pattern represents the digit '1', the second '2', the third '3', and the fourth '4'. Each pattern is composed of black dots on a white background.

